Geological Survey
Ottawa, Can.
6th Dec: 1897.

My dear Mr. Foot—

Your letter of 1st
just reached me on Saturday and
I am glad to hear that you
had enjoyed your outing on our
island so much—.
I had a very very interesting letter
from Mr. Burt, but I have been
intending to reply to mine since
I got it until to-day.

Many thanks for your kind
congratulations on my election to
the Royal Society.
As to the kind of letters you enquire
for I do sometimes receive letters
from eminent men and I will
be glad to look up some such
may be worth your while to
preserve. But all my papers

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and in fact all my belongings except
common furniture in every day use
are packed away in boxes. I have
been away a great deal for the
last two years, away as I was
also been abroad for two years and
we packed up all books, papers, &c. &
left our house furnished - Since my
return I have been so busy
any day to start & work enough
things not immediately required -
But I shall not forget what you
want & when I come across
them will send to you -
Kindly remember me to Mr & Mrs.
Frothingham & Mr. Bartlett
believe me yours very truly
Robert Bell -

E. H. Ford Esq.
New York -

EXPLORING HUDSON STRAIT.

Ottawa, Ont., Oct. 23.—The dominion parliament in 1896 voted $35,000 for an expedition by sea to make certain explorations in Hudson strait and bay. One of the objects of the enterprise was to observe from a steamship the conditions of the straits during a whole season, for which purpose the ship was to be kept running in and out between the Atlantic ocean and the bay from spring until autumn. The conditions of the strait had been observed during 1884, 1885 and 1886 from five stations established by the Canadian government on the opposite shores, and the present season's operations (which are being carried on still) are intended to supplement the work done in the above years.

DR. ROBERT BELL.

A second object of the expedition was to try to determine whether or not valuable fisheries for cod exist in the bay, as Dr. Robert Bell's exploration on the east coast in 1877 had demonstrated the existence of this fish in these waters. Dr. Bell is assistant director of the Canadian geological survey, a fellow of the Royal society of England and one of the brightest scientists and most intrepid explorers in the dominion. Whatever opinion might be entertained as to the utility of expenditure for the foregoing purposes, there can be no doubt as to the advantages to be derived from the small additional outlay by another department of the government for a third object—namely, a geological exploration of the shores of Hudson strait. The geological parties were under Dr. Bell on the north side and A. P. Low on the south shore. These men returned to Ottawa recently, having been brought back by the expeditionary steamer to St. Johns, N. F., as arranged at the outset. The other members of the expedition also have sent in reports of progress up to the time of their visit to St. Johns, from which, as well as from the geologists themselves, the following particulars have been gathered. The steamer has returned to Hudson strait in order to test its navigability to a later period.

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The vessel selected for the work was the sealing steamer Diana of St. Johns. It was specially prepared for work, and was intended to start north from Halifax, N. S., May 23, but did not leave till June 3. On its way up the vessel took the west side of Newfoundland and passed through the Straits of Belle Isle without any difficulty, but when off the coast of Labrador it entered the ice floe and at one place was delayed for more than a week. June 22 the Diana entered Hudson strait, which then appeared to be clear of ice in the center and on the south side, but the vessel stuck fast in a pack near Big island, which stands out into the strait like a pier about half way up the north side. Here the wind and tide forced the ice against Big island and the ship was in danger of being crushed, but escaped with a slight nip. As soon as the ice slackened the Diana again steamed westward and entered Hudson bay without difficulty.

The ship carried upon its deck two small yachts for the geological parties. The original intention was to land Dr. Bell, with his party, near King's cape, the angle formed between Fox basin and Hudson strait, from which he might coast eastward to Ashe inlet on Big island, and to land Mr. Low at Cape Wolstenholme, on the opposite side of the strait. On the way eastward from this first run into the bay an attempt was made to land the doctor at King's cape July 14 and 15, but the coast was found to be packed with ice. The Diana then crossed to the middle of the south shore of Hudson strait and landed Mr. Low in King George's sound July 18. From this bay he coasted eastward to Ungava river, where he awaited the Diana, by which he was picked up Sept. 19. After leaving Mr. Low on the south shore the ship crossed to Big island and launched Dr. Bell's yacht in Ashe inlet on July 20. This boat was a very neat craft and a good sailer, but only thirty-five feet long. It carried three and one-half tons of pig-iron ballast, had a cabin for the doctor, a galley with a coal-oil cook stove and sleeping accommodation for five men. It was arranged that the Diana should call for Dr. Bell at the same inlet Sept. 10. In the meantime he was to explore the coast to the northwest as far as possible and return. This he managed to do very successfully, in spite of many difficulties and dangers, and also to explore some of the interior of Baffinland and to return to Big island ten days before the appointed date. The interval was filled up by extending his explorations eastward of Big island almost as far as Icy cove.

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The northern side of Hudson strait is the southern coast of Baffinland, which is the third largest island in the world, being 1,150 miles in length. The island of Greenland and the island of Australia alone exceed it in length. Hudson strait is about 500 miles long and averages nearly 100 miles in width. Big island, which lies near the north side, is thirty miles long and about twenty miles wide. Both shores of the strait are mountainous and destitute of trees, being beyond the limits of the northern forests. The land along the western half of the south shore is higher and bolder than any other part of these coasts and rises to a height of between 1,000 and 2,000 feet immediately above the sea. The eastern half of the south coast is rather low and is not broken by any mountain range. Dr. Bell says: "The whole north shore is rugged, but it rises more gradually as we go back from the sea and attains a general elevation of from 1,000 to 1,500 feet at a distance of from ten to twenty miles inland, although some parts are higher. Between Frobisher bay and the eastern part of Hudson strait Grinnell glacier, an extensive sheet of ice, covers this range and may be seen from a long distance on a clear day, although one may pass through Hudson strait often without observing it. In the spring a cold, ice-laden current, flowing in from Davis strait, passes up the north side of Hudson strait, while the warmer water of Hudson bay flows out along the south shore. The north side has therefore a more arctic character than the south."

When Mr. Bell began his exploration, July 20, the south shore was comparatively free, while the north side had a cold, forbidding appearance. The "ice-foot," twenty to thirty feet thick, still adhered to the rocks all along except in some of the inlets. At the outset of his journey Dr. Bell was fortunate enough to find an Eskimo who knew the coast and at the same time understood English pretty well. The greater part of the coast to be explored was so completely unknown that it was not indicated on the charts even by a dotted line. Passing to the northwest of Big island, the mainland soon became fringed with many islands, and a little farther on the whole coast seemed to be broken up into innumerable mountainous islands of all sizes, from single hills of rock surrounded by water to ranges miles in length. This border of islands ranged from ten to twenty miles in width—indeed, it was difficult to know when the mainland really was reached. Even they could see many channels of the sea running in all directions among the high hills, and besides the channels and those separating the islands a number of large fiords, running far inland, were discovered and explored. These geographical conditions are due to the geological structure—to the great development of crystalline rocks, their extensive erosion and partial submergence. Dr. Bell does not recall such a striking example of this kind of topography in any other part of the world. In some respects the northeast coast of Georgian bay resembles it on a small scale, but here glaciation has reduced the general surface to a low level and a comparatively even outline.

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Toward the end of August Dr. Bell had explored and mapped the coast nearly as far as King's cape, where he met with heavy ice which may have come out of Fox basin. As he had appointed Sept. 10 for meeting the Diana at Ashe inlet, he judged it time to turn back, and made a fine run outisde of the great belt of islands, reaching the inlet in advance of the date agreed upon. In the course of his westward exploration the ice at one time completely barred Dr. Bell's progress. While waiting for an open passage through it he determined to make a journey inland, in order, if possible, to visit the great lakes which had been reported to exist there. Accompanied by three of his men, he walked over the bare, mountainous country and fixed the position of two of these large lakes, the southern shores of which come within fifty or sixty miles of Hudson strait. This proved a very interesting exploration, the intervening country being picturesque and full of clear lakes and streams. Two small glaciers also were passed.

Only a small number of Eskimos were met with by Dr. Bell's party. In this region these people retain most of their primitive habits, dressing in clothing made from the skins of seals and reindeer. Still they are dependent upon the white man for guns, ammunition and some other necessaries. They are a cheerful, friendly people, and always are glad to meet the explorers. The Diana is expected at St. Johns in about two weeks, with final reports as to the navigability of Hudson strait.

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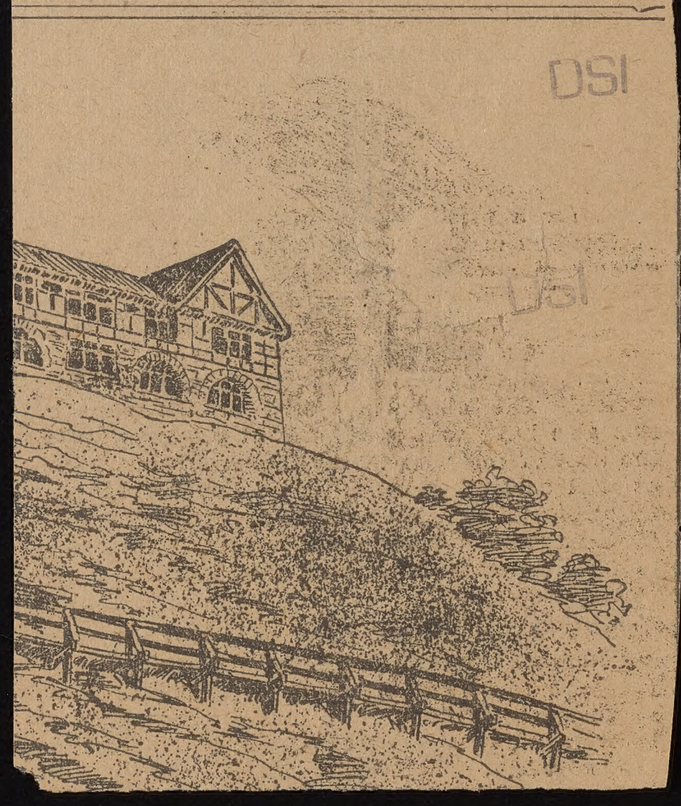
day. The warerooms, which open directly from the portico, are crowded with the ware displayed upon tables and in cases. A visitor is nervous lest an unfortunate movement should dislodge some beautiful piece. But it is testimony to the expert handling of the pottery workers that the only appreciable loss on the ware is in the kilns.

How the Ware "Grows."

From the warerooms the visitor on a tou of inspection passes by winding ways throug the apartments of the main floor, where th ware is seen in different stages of its growth for a piece of Rookwood literally grows t completion. There is a puff of hot air a the drying room is opened, where the plas ter-of-paris molds are stacked upon shelves At long tables men are working at piece set on "whirlers," metal disks that spi round so fast as to seem motionless. On similar table are granite iron buckets ful of liquid clay ready to pour into molds whic stand near. One of the daintiest little op erations of the pottery is the putting on o the graceful handles of vases, urns, pitch ers and mugs. This is done while the pieces are in about the same degree of moisture as when being decorated. Apart, in a small room, on rough, irregular, open shelving, are set the decorated pieces. In another room are the great covered tubs of glaze, into which are dipped the pieces that have been decorated and fired. Opposite the glaze tubs are closed cupboards, where the pieces rest after glazing, before going into the kilns for



FROM THE CITY SIDE.

the second firing. The glazed pieces in the cupboard show no sign of decoration, no beauty of coloring. Blotted out, veiled by the glaze, the beauty is in hiding, waiting for the kiln fire to melt the glaze and make it transparent; then the colors will reappear, transmuted. It is the specialty of Rookwood to produce beauty, not uniformity, and the workers are content to permit the elements employed a very free rein so long as they evolve beauty.

For firing, the ware is placed in receptacles of yellow fire-clay, duplicating in shape and average size the old-style bandbox of the milliners, but without lid. In the first firing the pieces are set in a layer of white sand. In the second or glaze firing they are perched on triangular stilts and thus lifted enough to permit the melted glaze to drip, without causing the piece to adhere to the bottom of the saggar. When pieces refuse to stand alone they are set upside down in plaster rings. That the saggars may be air tight in the kilns, and so protect their contents, inch-thick rolls of moist fire-clay are glued by their own stickiness around the edge of the saggars, and when the saggars are tiered in the kiln, one saggar directly upon another, the clay effectually seals them.

Where the Pottery Is Fired.

Of striking interest to the sightseer are the kilns. They are immense structures, half cone, half dome, and of brick covered with cement, separated from one another and from everything else. The great doorway of each kiln is reached by a little bridge from the main floor. This doorway has a new door fitted to it at every firing, the opening being bricked up and cemented after the kiln is filled, and the door thus formed torn out again when the kiln is to be emptied. The fuel is crude oil. It requires sixty hours to fire the ware, and seven days to cool the kiln for opening.

When the first kiln was drawn in 1880 the manufacture of Rookwood was a simpler process than now, when each piece passes through more than twenty hands. The first pieces taken out were sent to Boston to be used by Edward Atkinson in connection with a lecture descriptive of a western trip in which he had become interested in the embryo pottery at Cincinnati. Their maker says of them: "They were poor little colorless things, having no more resemblance to the Rookwood pottery of to-day than the ugly duckling did the swan, and yet they bore the same relationship to it. The earlier pieces are hard and staring in effect and cold in color. The rich glow is given solely by the special glazing, which belongs to the Rookwood pottery alone. This warm effect of color through glaze I discovered in 1883, when attempting to give rich tone to red clay under glaze. Every bit of red clay before this was a dull chocolate brown when glazed."

Characteristics in Texture and Color.

It has a range of deep, rich browns, reds and yellows, with a dark-green interplay. This color range was the natural product of the native clay. It was characteristic of the early work and it still leads in any exhibit of the ware; but the later work embraces a range of light tints. These new effects are the aerial blue, the iris and the sea-green. In the last the tints play around the color from which they take their name; in the iris a warm gray is a basis for the softest, creamiest pinks, blues, greens, whites and yellows; the aerial blue shows celestial blue on a ground of gray-white, pure and cool.

A clear, translucent amber is a new and beautiful color that is producing some of the most fascinating of latest ware. Where this is in solid color it is wonderful by its own quality, but set against dark green it becomes irresistible, as in an urn where the body of the piece is in amber, changing to deep green toward the throat. A wreath of laurel leaves flung over the vase has fallen just far enough to mark the transition. Certain variations in the glaze have appeared often enough to make names for themselves, as the tiger eye and the goldstone in the dark grounds.

The growing fondness at Rookwood for the light-color ranges is to some a prophecy of a change to white glaze. The light ware is costly because requiring specially careful decorative treatment by the best artists.

Why Prices Are High.

That the prices of Rookwood pottery are maintained at figures which place the ware beyond the reach of the multitude is justified by the entire process of its manufacture, but particularly by the fact that the ware is decorated on the moist clay before firing. Thus all the risk of firing is run by the decorated pieces. How great is this risk is shown by the fact that the percentage of spoiled pieces is from 25 to 50. "Many a time," says Mrs. Storer, "I have almost wept over the clay fragments of what had been a beautiful work of art, or at a great fire-crack in a piece just drawn from the kiln." Even if the first firing leaves the piece intact the second may damage it irreparably. The glaze may be "bubbled all over like smallpox" or may be crazed. The light ware, however, is seldom if ever crazed and in the dark ware a due amount of crazing is discounted as an imperfection which "no potter on earth can help."

Rookwood marks are in themselves an interesting study. The Rookwood trademark, incised, impressed, painted, stamped, or in relief, and altered from year to year, is supplemented by the shape number, the size letter, the clay letter; as W for white; Y for yellow; R for red; G for ginger; S for sage, and the decorator's signature—the artist's initials or monogram—cut upon the base. Altogether Rookwood pottery is supplied with a creditable outfit of hieroglyphics wherewith to puzzle the archæological brains of possible excavators. If the identity of anything is preserved after the earth's conglomeration by the sunspot the new race will discover Cincinnati's beautiful pottery in the debris of every land, for already Rookwood pottery goes all over the world.

BELL, Robert. (1841-1917.)

Canadian geologist. Naturalist and geologist of expeditions (1884,1885, 1897) to Baffin Bay and south coast of Baffin Land. Director of Geological Survey of Canada.